

# Catalyst 2000 MIB Extensions

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The Catalyst 2000 MIB extensions are grouped into the following categories:

- System Information (sysInfo)
- System Configuration (sysConfig)
- Switched Ports (port)
- Management Console (netMgmt)
- Upgrade Group (upgrade)
- Vlan Group
- Bandwidth Usage Group

These groups and their associated MIB objects are detailed in the following sections.

## System Information

All objects in this group are read-only and return system-wide information. This group is one set of extensions to the MIB II System Group, with some objects serving as mirror images of objects in the System Configuration (sysConfig) Group.

### sysInfoFwdEngineRevision (integer)

This read-only MIB object returns the revision number of the forwarding engine ASIC.

## System Information

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### sysInfoBoardRevision (integer)

This read-only MIB object returns the revision number of the main Catalyst 2000 board on which the Catalyst 2000 firmware resides.

### sysInfoTotalNumberOfPorts (integer)

This read-only MIB object displays the total number of physical ports. This MIB object *does not* represent the upper bound of indices into port tables. See `sysInfoNumberOfSwitchPorts` and `sysInfoNumberOfSharedPorts` for that purpose.

Valid Values: 25 to 41

### sysInfoNumberOfSwitchPorts (integer)

This read-only MIB object displays the number of ports that are individually switched. This number includes the high-speed expansion slots. Each of these ports has hardware support for a full range of statistics and management controls. This MIB object represents the upper bound of indices into the various port tables in the port group.

Valid Values: 2  
7

### sysInfoNumberOfSharedPorts (integer)

This read-only MIB object displays the number of ports that are collectively switched. Hardware supported statistics are available for these ports as a whole. Management controls are limited to enabling and disabling of the port.

Valid Values: 0 to 16

**sysInfoNumberOfInstalledModules (counter)**

This read-only MIB object displays the number of the Catalyst 2000 high-speed expansion slots with installed and recognized modules. Hardware supported statistics are available for installed modules. For repeater-group modules, statistics are supported for the group as a whole. Management controls for an individual repeater port on a module are limited to enabling and disabling the port.

Valid Values: 0 to 2

**sysInfoBuffersUsed (gauge)**

This read-only MIB object displays the high-water mark of frame buffer usage in this Catalyst 2000.

Valid Values: 28 to 2046

Default Value: 28

**sysInfoMaxBuffers (counter)**

This read-only MIB object contains the number of times sysBuffersUsed has reached its maximum value and been reset to zero by the Catalyst 2000.

**sysInfoUtilDisplay (integer)**

This read-only MIB object displays the number of utilization meter LEDs currently lit on the front panel.

Valid Values: 0 to 10

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### sysInfoAddrCapacity (integer)

This read-only MIB object displays the system-wide maximum number of addresses supported. This address capacity includes both dynamic and static address types.

Valid Values:            1024 (Catalyst 2100)  
                             2048 (Catalyst 2800)  
                             8192 (Catalyst 2800)

### sysInfoRestrictedStaticAddrCapacity (integer)

This read-only MIB object displays the system-wide maximum number of restricted static addresses supported. This object is a subset of sysInfoAddrCapacity.

Valid Values: 128

**sysInfoPOSTResult (integer)**

This read-only MIB object displays a bit array where the presence of a particular bit indicates the failure of one of the Power On Self Tests.

The following are valid values:

<b>Bit</b>	<b>POST Test</b>
2 <sup>0</sup>	ports
2 <sup>1</sup>	station address PROM
2 <sup>2</sup>	content addressable memory
2 <sup>3</sup>	watchdog interrupt
2 <sup>4</sup>	RS-232 port
2 <sup>5</sup>	real time clock
2 <sup>6</sup>	system timer interrupt
2 <sup>7</sup>	port control/status
2 <sup>8</sup>	DRAM
2 <sup>9</sup>	DRAM
2 <sup>10</sup>	forwarding engine
2 <sup>11</sup>	forwarding engine
2 <sup>12</sup>	non volatile RAM
2 <sup>13</sup>	SRAM
2 <sup>14</sup>	EPROM

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### sysInfoPortFailedPOSTMap (octet string)

This read-only MIB object displays a bit array where the presence of a particular bit indicates a failure of a port, as determined by the POST *individual ports* test.

The following are the valid values:

Bit	Failed Port
2 <sup>0</sup>	1
2 <sup>1</sup>	2
2 <sup>2</sup>	3
2 <sup>3</sup>	4
2 <sup>4</sup>	5
2 <sup>5</sup>	6
2 <sup>6</sup>	7
2 <sup>7</sup>	8
2 <sup>8</sup>	9
2 <sup>9</sup>	10
2 <sup>10</sup>	11
2 <sup>11</sup>	12
2 <sup>12</sup>	13
2 <sup>13</sup>	14
2 <sup>14</sup>	15
2 <sup>15</sup>	16
2 <sup>16</sup>	17
2 <sup>17</sup>	18
2 <sup>18</sup>	19
2 <sup>19</sup>	20
2 <sup>20</sup>	21
2 <sup>21</sup>	22
2 <sup>22</sup>	23

Bit	Failed Port
2 <sup>23</sup>	24
2 <sup>24</sup>	25
2 <sup>25</sup>	26
2 <sup>26</sup>	27

**sysInfoPortLinkDisplayMap (octet string)**

This read-only MIB object displays a bit array where the presence of a particular bit indicates a lit link LED for a port. If that bit has a value of 1, then that LED is currently lit; the LED is not lit if its bit has a value of 0. The bits are arranged in a series of octets. Within each octet, the most significant bit represents the lowest numbered LED.

**sysInfoPortDisabledDisplayMap (octet string)**

This read-only MIB object displays a bit array where the presence of a particular bit indicates a lit disabled LED for a port. If that bit has a value of 1, then that LED is currently lit; the LED is not lit if its bit has a value of 0. The bits are arranged in a series of octets. Within each octet, the most significant bit represents the lowest numbered LED.

## System Configuration

This group consists of another set of extensions to the MIB II System Group. All objects in this group are read-write; some objects serve as a definable mirror image of objects in the System Information (sysInfo) Group.

## System Information

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### sysConfigReset (integer)

Setting this read-write MIB object to reset causes a complete reset of both hardware and software but does not run the POST (Power-On Self-Test). All parameters, including all static addresses, are retained.

Setting this object to noReset has no effect. The Catalyst 2000 always returns the value noReset when this object is read.

Valid Values: noReset (1)  
reset (2)

Default Value: noReset (1)

### sysConfigDefaultReset (integer)

Setting this read-write MIB object to reset causes a complete reset of both hardware and software but does not run the POST (Power-On Self-Test). All configuration parameters will revert to their factory default settings, and all addresses assigned will be removed. The content of FLASH memory remains unchanged. The Catalyst 2000 will execute the firmware from the same source (EPROM or FLASH) after coming out of reset.

Setting this object to noReset has no effect. The Catalyst 2000 always returns the value noReset when this object is read.

Valid Values: noReset (1)  
reset (2)

Default Value: noReset (1)



### sysConfigClearPortStats (integer)

Setting this read-write MIB object to noClear results in no action. When set to clear, the Catalyst 2000 will reset all port statistics to zero. Port statistics are kept in the switchPortTable, the switchPortTxStatTable, the switchPortRxStatTable, and the switchPortTxCollTable.

This object always returns noClear when read.

Valid Values: noClear (1)

clear (2)

Default Value: noClear (1)

### sysConfigAddressViolationAction (integer)

This read-write MIB object indicates what action to take when an address violation (an address mismatch or duplication) occurs on a secure port.

Available actions are:

- Suspend—Port is suspended until the correct address is again received. While suspended, port will not forward frames it receives, nor will it accept frames to be forwarded.
- Disable—Port is disabled and will not forward any frames as in the case of suspension above. Port can only be reenabled by explicit management action on the part of the user.
- Ignore—Do nothing to the port (discard the offending address).

Valid Values: suspend (1)

disable (2)

ignore (3)

Default Value: suspend (1)

## System Information

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### sysConfigAddressViolationAlert (integer)

When this read-write MIB object is set to enabled, the Catalyst 2000 will generate an addressViolation trap upon detecting an address violation on a secure port. When set to disabled, no such trap will be issued for address violation on secure ports.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

### sysConfigSwitchingMode (integer)

The Catalyst 2000 can operate as a high speed cut-through switch, or as a traditional store-and-forward switch. Cut-through switching of frames is enabled when this read-write MIB object is set to Fast-Forward or FragmentFree. This works to reduce buffering latency by attempting to forward a frame before reception is completed. Cut-through switching does not take effect for frames that are addressed to a broadcast address. These frames are switched using the store-and-forward method. Multicast frames can be switched as set by this MIB object or can be forced to the store-and-forward mode using the object sysConfigMulticastStoreAndForward.

The three possible switching modes are defined as follows:

- Store-and-forward: Buffer the entire frame before forwarding it to the appropriate destination.
- FragmentFree: Forward the frame to the appropriate destination after receiving 64 bytes.
- FastForward: Minimize latency by making the forwarding decision as soon as possible during frame reception (after 6 bytes plus preamble).

Valid Values: store-and-forward (1)

FragmentFree (2)

FastForward (3)

Default Value: FastForward (3)

### sysConfigMulticastStoreAndForward (integer)

When this read-write MIB object is set to enabled, the switching of multicast frames will use the store-and-forward method, regardless of the setting of sysConfigSwitchingMode. When set to disabled, multicast frames will be switched according to the current setting of sysConfigSwitchingMode.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### sysConfigMonitor (integer)

This read-write MIB object selects whether frames to or from certain ports are sent to sysConfigMonitorPort. A port is selected for monitoring purposes when its swPortMonitoring object is set to enabled.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### sysConfigMonitorPort (integer)

This read-write MIB object displays the port number to which all frames to or from monitored ports are sent. Frames are only monitored if the sysConfigMonitor object is set to enabled.

Port 0 specifies that frames are to be monitored internally by the Catalyst 2000 switch. A number from 1 to 27 selects a Catalyst 2000 switch port. The number 26 selects port F1 (called port A on the Catalyst 2800), 27 selects port F2 (port B on the Catalyst 2800). The number 31 selects no monitor port.

Valid Values: 0 to sysInfoTotalNumberOfPorts, 31

Default Value: 31

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### sysConfigHigherProtocolMonitor (integer)

This read-write MIB object selects whether frames addressed to and from the higher-layer protocol processor of the Catalyst 2000 switch are to be monitored. The higher-layer protocol processor is the entity that responds to all SNMP/TFTP/XNSEcho management requests.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### sysConfigPort25Connector (integer)

This read-write MIB object is used to specify which of the two connector types is providing active connection on port 25. Setting the connector to self-sensing allows the Catalyst 2000 switch to learn the active connector for port 25 on its own. The other two possible values which force the Catalyst 2000 switch to use the chosen type are:

- RJ45: 10Base-T RJ-45 connector
- AUI: 10Base-5 thick-wire connector

Valid Values: self-sensing (1)

rj45 (2)

au1 (4)

Default Value: self-sensing (1)

### sysConfigHeuristics (integer)

This read-write MIB object displays a value which enables special heuristic functions to be used by Cisco customer support.

### sysConfigEnableSTP (integer)

The Catalyst 2000 switch implements the 802.1d Spanning-Tree Protocol on all its ports to detect loops in the bridge topology. The user may, for any reason, elect to disable the execution of Spanning-Tree Protocol by setting this read-write MIB object to disabled.

When Spanning-Tree Protocol is disabled, all ports currently in suspended-stp status will immediately transition to enabled status and frame forwarding will resume. When Spanning-Tree Protocol is enabled, after having been previously disabled, all ports will transition to suspended-stp status. Suspended-stp ports will transition to enabled according to the Spanning-Tree Protocol.

Valid Values: enabled (1)  
disabled (2)

Default Value: enabled (1)

### sysConfigStrictSTPTransition (integer)

The 802.1d Spanning-Tree Protocol dictates that a port must start out in the blocking state and transition through two other intermediate states, listening and learning, before it can begin forwarding frames. These state transitions help prevent temporary loops in the bridge topology.

The Catalyst 2000 switch implements a special algorithm where a single address port may move to the forwarding state as soon as it is enabled after having been suspended for address violation or jabber. In the strictest sense, this does not comply with the 802.1d Spanning-Tree Protocol. To force compliance, set this read-write MIB object to enabled.

Valid Values: enabled (1)  
disabled (2)

Default Value: disabled (2)

## System Information

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### Switched Ports

This group of extensions provides for the configuration and management of individual Catalyst 2000 switched ports.

### Port Configurations

This group of extensions provide general configurations, some of which are read-only, some of which are read-write, for a corresponding port.

#### switchPortTable

This read-only MIB object displays a list of configuration entries for individually switched ports.

#### swPortIndex (integer)

This read-only MIB object displays a number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables in this MIB group selects the same port.

#### swPortControllerRevision (integer)

This read-only MIB object returns the revision number of the port controller.

#### swPortName (display string)

This read-write MIB object contains a descriptive string of up to 60 characters used by the network administrator to name a port.

#### swPortMediaCapability (integer)

This read-only MIB object displays the port media capability which is one of the following:

- Other: none of the following
- Private-ethernet: dedicated 10 Mbps Ethernet port

- General-ethernet: non-dedicated 10 Mbps Ethernet port
- General-fast-ethernet: non-dedicated 100 Mbps Ethernet port
- Private-fast-ethernet: dedicated 100 Mbps Ethernet port
- Repeated-fast-ethernet: repeated 100 Mbps Ethernet port
- FDDI: FDDI module

Valid Values:	other	(1)
	private-ethernet	(2)
	general-ethernet	(3)
	general-fast-ethernet	(4)
	private-fast-ethernet	(5)
	repeated-fast-ethernet	(6)
	fddi	(7)

### swPortType (integer)

This read-only MIB object identifies whether the port is:

- Other
- Network: Port does not have address number restriction while it is unsecured. A secure Network port has an imposed limit on the maximum number of addresses it can have. See the object swPortAddressTableSize for this upper maximum value.

Valid Values:	other	(1)
	network	(2)

Default Value: network (2)

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### swPortConnectorType (integer)

This read-only MIB object displays the type of connector the port is currently using. It is one of the following:

- Other: none of the following (unknown)
- RJ45: common unshielded twisted pair connector
- BNC: thin-coax (BNC)
- AUI: thick-coax (AUI)
- Fiber-SC: fiber SC Fast Ethernet connector
- Fiber-ST: fiber ST Fast Ethernet connector
- Empty: port is not installed
- Group: the switch port contains a group of connectors
- FDDI-mic: FDDI fiber optic MIC connector

Valid Values: other (1)  
rj45 (2)  
bnc (3)  
aui (4)  
fiber-sc (5)  
fiber-st (6)  
empty (7)  
group (8)  
fddi-mic (10)



### swPortFullDuplex (integer)

Set this object to enabled to enable full-duplex transmission on a 100-Mbps port. In this mode, a port will allow simultaneous transmit and receive which can double its bandwidth. Set to disabled to operate in normal half-duplex mode. This read-write MIB object may not be set to enabled for a 10-Mbps port. Doing so will result in badValue.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### swPortStatus (integer)

This read-only MIB object displays the current operational status of the port. Any swPortStatus of type disabled-xxxxxx (except disabled-self-test) is saved across a system reset so a port can also have such a status.

The following are possible statuses:

- Enabled: normal operation (transmit and receive)
- Disabled-mgmt: disabled by explicit management action
- Suspended-linkbeat: suspended due to absence of linkbeat
- Suspended-jabber: suspended because port is jabbering
- Suspended-violation: suspended due to a secure address violation
- Disabled-violation: disabled due to a secure address violation
- Suspended-not-present: there is no module inserted in the expansion slot
- Suspended-not-recognized: there is an unrecognized module inserted in the expansion slot
- Reset: the port is currently in the reset state
- Suspended-ringdown: suspended due to a ring-down condition
- Suspended-stp: Spanning-Tree Protocol nonforwarding state
- Disabled-self-test: disabled because port fails self-test

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Valid Values:	enabled	(1)
	disabled-mgmt	(2)
	suspended-linkbeat	(3)
	suspended-jabber	(4)
	suspended-violation	(5)
	disabled-violation	(7)
	suspended-not-present	(9)
	suspended-not-recognized	(10)
	reset	(11)
	suspended-ringdown	(12)
	suspended-stp	(13)
	disabled-self-test	(14)

### swPortAdminStatus (integer)

This read-write MIB object is used to change the port status to either:

- Enabled: normal status (transmit and receive)
- Disabled-mgmt: transmit and receive disabled

Valid Values:	enabled	(1)
	disabled-mgmt	(2)

Default Value: enabled (1)

**swPortLastStatus (integer)**

This read-only MIB object displays the value of swPortStatus prior to its current value, or enabled, if swPortStatusChanges is zero.

- Valid Values:
- enabled (1)
  - disabled-mgmt (2)
  - suspended-linkbeat (3)
  - suspended-jabber (4)
  - suspended-violation (5)
  - disabled-violation (7)
  - suspended-not-present (9)
  - suspended-not-recognized (10)
  - reset (11)
  - suspended-ringdown (12)
  - suspended-stp (13)
  - disabled-self-test (14)

**swPortStatusChanges (counter)**

This read-only MIB object returns the number of times swPortStatus has changed.

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### swPortAddressingSecurity (integer)

This read-write MIB object is set to enabled to secure a port and to disabled to leave the port unsecure.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### swPortAddressTableSize (integer)

This read-write MIB object is for specifying the address table size. For a secure Network port, the address table size can range from 1 to 132. For an unsecure Network port, the size is unrestricted (shown as the value zero) and is, therefore, not settable. Any attempt to violate these rules will result in a badValue error.

Valid Values: 0 to 132

Default Value: 132

### swPortNumberOfLearnedAddresses (integer)

This read-only MIB object displays the current number of dynamically learned addresses on the port.

### swPortNumberOfStaticAddresses (integer)

This read-only MIB object displays the current number of statically assigned unicast addresses on the port.

**swPortEraseAddresses (integer)**

This read-write MIB object is set to delete all learned and assigned static unicast addresses on a given port. Setting the object to noErase has no effect. This object always returns noErase when read.

Valid Values: noErase (1)

erase (2)

Default Value: noErase (1)

**swPortFloodUnregisteredMulticasts (integer)**

This read-write MIB object is set to enabled to allow the forwarding to this port frames addressed to multicast addresses that have not been registered for the port. Set to disabled to filter and discard such frames.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

**swPortFloodUnknownUnicasts (integer)**

This read-write MIB object controls the forwarding of unknown unicast frames to this port. When set to enabled, a frame with an unknown unicast destination address that was received on another port will be transmitted to this port. When set to disabled, unknown unicast frames will be filtered and not transmitted to this port.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

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### swPortMonitoring (integer)

This read-write MIB object is set to enabled to forward receive-and-transmit frames on this port to the port identified by sysConfigMonitorPort. Set to disabled to not monitor frame traffic on this port.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

### swPortSecuredAddressViolations (counter)

This read-only MIB object returns the number of times a source address was seen on this port which duplicates a secure address configured on another port, plus the number of times a source address was seen on this port which does not match any secured addresses configured for the port.

### swPortLinkbeatStatus (integer)

This read-only MIB object displays the current port linkbeat status.

Valid Values: linkbeat (1)

noLinkbeat (2)

### swPortLinkbeatLosses (counter)

This read-only MIB object returns the number of times that the value of swPortLinkbeatStatus has changed from linkbeat to noLinkbeat.

**swPortJabberStatus (integer)**

This read-only MIB object displays the current port jabber status.

Valid Values: notJabbering (1)

jabbering (2)

**swPortJabbers (counter)**

This read-only MIB object returns the number of times that the jabber function has to be invoked because a frame transmitted from this port exceeded a certain time duration.

**swPortClearStatistics (integer)**

This read-write MIB object is set to clear all statistics associated with the port. Per-port statistics are kept in this swPortTable as well as in the swPortRxStatTable, swPortTxStatTable, swPortTxCollTable, dot1dBasePortTable, and dot1dTpPortTable. Setting this object to noClear has no effect. This object always returns noClear when read.

Valid Values: noClear (1)

clear (2)

Default Value: noClear (1)

**The Switch Port Receive Statistics Table**

These statistics are related to reception activities on the ports.

**switchPortRxStatTable**

This read-only MIB object displays a list of switch port Receive statistics entries.

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### swPortRxStatIndex (integer)

This read-only MIB object displays a number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables in this MIB group selects the same port.

### swPortRxTotalFrames (counter)

This read-only MIB object returns a count of all frames that are successfully received. This does not include frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

### swPortRxTotalOctets (counter)

This read-only MIB object returns a count of data and padding octets in all frames that are successfully received. This does not include octets in frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

### swPortRxTotalOctetsWraps (counter)

This read-only MIB object contains the number of times the value in swPortRxTotalOctets has rolled to zero.

### swPortRxUnicastFrames (counter)

This read-only MIB object displays a count of frames that were successfully received and directed to a unicast address. This does not include frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

### swPortRxUnicastOctets (counter)

This read-only MIB object returns a count of data and padding octets in unicast frames that were successfully received. This does not include octets in frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.



**swPortRxUnicastOctetsWraps (counter)**

This read-only MIB object displays the number of times the value in swPortRxUnicastOctets has rolled to zero.

**swPortRxBroadcastFrames (counter)**

This read-only MIB object contains a count of frames that were successfully received and directed to the broadcast address. This does not include frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

**swPortRxBroadcastOctets (counter)**

This read-only MIB object returns a count of data and padding octets in broadcast frames that were successfully received. This does not include octets in frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

**swPortRxBroadcastOctetsWraps (counter)**

This read-only MIB object displays the number of times the value in swPortRxBroadcastOctets has rolled to zero.

**swPortRxMulticastFrames (counter)**

This read-only MIB object contains a count of frames that were successfully received and directed to a multicast address. This does not include frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

**swPortRxMulticastOctets (counter)**

This read-only MIB object returns a count of data and padding octets in multicast frames that were successfully received. This does not include octets in frames received with frame-too-long, FCS, length or alignment errors, or frames lost due to an internal MAC sublayer error.

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### swPortRxMulticastOctetsWraps (counter)

This read-only MIB object displays the number of times the value in swPortRxMulticastOctets has rolled to zero.

### swPortRxForwardedFrames (counter)

This read-only MIB object contains a count of frames received and forwarded to other port or ports for transmission.

### swPortRxFilteredFrames (counter)

This read-only MIB object contains a count of frames received that were discarded for one of the following reasons:

- The frames were local to the segment
- No destination address matches could be found and no ports were set up to accept such frames
- The destination addresses matched but source port specific information prevented their forwarding
- The destination addresses matched but no destination ports have been specified for them, or
- The destinations were non-registered multicasts and no ports were configured to accept them

### swPortRxNoBufferDiscards (counter)

This read-only MIB object returns a count of frames received that were discarded due to a lack of frame buffer resources in the Catalyst 2000 switch's forwarding engine.

### swPortRxFCSErrors (counter)

This read-only MIB object displays a count of frames received that are an integral number of octets in length but do not pass the Frame Check Sequence test.

**swPortRxAlignmentErrors (counter)**

This read-only MIB object returns a count of frames received that are not an integral number of octets in length and do not pass the Frame Check Sequence test.

**swPortRxFrameTooLongs (counter)**

This read-only MIB object displays a count of frames received that exceed the maximum permitted frame size as defined by the corresponding ifMtu object.

**swPortRxBunts (counter)**

This read-only MIB object returns a count of frames received that are shorter than the minimum permitted frame size. Runts usually indicate collision fragments, a normal network event.

**Switch Port Transmit Statistics**

These statistics are related to transmission activities on the ports.

**switchPortTxStatTable**

This read-only MIB object displays a list of switch port transmit statistics entries.

**swPortTxStatIndex (integer)**

This read-only MIB object displays a number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables in this MIB group selects the same port.

**swPortTxTotalFrames (counter)**

This read-only MIB object returns a count of all frames that were successfully transmitted.

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### swPortTxTotalOctets (counter)

This read-only MIB object contains a count of data and padding octets in all frames that were successfully transmitted.

### swPortTxTotalOctetsWraps (counter)

This read-only MIB object contains the number of times the value in swPortTxTotalOctets has rolled to zero.

### swPortTxUnicastFrames (counter)

This read-only MIB object returns a count of frames that were successfully transmitted and directed to a unicast address.

### swPortTxUnicastOctets (counter)

This read-only MIB object displays a count of data and padding octets in unicast frames that were successfully transmitted.

### swPortTxUnicastOctetsWraps (counter)

This read-only MIB object returns the number of times the value in swPortTxUnicastOctets has rolled to zero.

### swPortTxBroadcastFrames (counter)

This read-only MIB object contains a count of frames that are successfully transmitted and are directed to the broadcast address.

### swPortTxBroadcastOctets (counter)

This read-only MIB object displays a count of data and padding octets in broadcast frames that are successfully transmitted.

**swPortTxBroadcastOctetsWraps (counter)**

This read-only MIB object returns the number of times the value in swPortTxBroadcastOctets has rolled to zero.

**swPortTxMulticastFrames (counter)**

This read-only MIB object displays a count of frames that were successfully transmitted and directed to a multicast address.

**swPortTxMulticastOctets (counter)**

This read-only MIB object returns a count of data and padding octets in multicast frames that were successfully transmitted.

**swPortTxMulticastOctetsWraps (counter)**

This read-only MIB object returns the number of times the value in swPortTxMulticastOctets has rolled to zero.

**swPortTxDeferrals (counter)**

This read-only MIB object contains a count of frames for which the first transmission attempt is delayed because the medium is busy.

**swPortTxSingleCollisions (counter)**

This read-only MIB object displays a count of successfully transmitted frames for which transmission is inhibited by exactly one collision.

**swPortTxMultipleCollisions (counter)**

This read-only MIB object returns a count of successfully transmitted frames for which transmission is inhibited by more than one collision.

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### swPortTxLateCollisions (counter)

This read-only MIB object contains the number of times that a collision is detected later than 512 bit-times into the transmission of a frame. A late collision is also considered as a (generic) collision for purposes of other collision-related statistics.

### swPortTxExcessiveCollisions (counter)

This read-only MIB object returns a count of frames for which transmission fails due to excessive collisions.

### swPortTxExcessiveDeferrals (counter)

This read-only MIB object displays a count of frames for which transmission is deferred for an excessive period of time.

### swPortTxQueueFullDiscards (counter)

This read-only MIB object returns a count of frames that cannot be transmitted because the transmit queue for the port is full.

### swPortTxErrors (counter)

This read-only MIB object returns a count of frames for which transmission fails due to an internal MAC sublayer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of one of the following objects:

- swPortTxLateCollisions
- swPortTxExcessiveCollisions

## Management Console

The following MIB objects relate to the management console described in the *Catalyst 2100 User Guide* and *Catalyst 2800 User Guide*. They can be used to configure modem communication parameters as well as security features. Use the RS-232 standard MIB, RFC-1317, to configure the physical characteristics of the RS-232 port. See the chapter “RFC-1317: RS-232 MIB Objects” for more information.

**netMgmtConsoleInactTime (integer)**

This read-write MIB object indicates the number of seconds of management console session inactivity to wait before ending the session. Once a session has ended, the user must resupply the console password to regain access.

Valid Values: 0 to 65500

Default Value: 0 (no time-out)

**netMgmtConsolePasswordThresh (integer)**

This read-write MIB object sets the number of consecutive invalid password attempts allowed before the management console closes for a configured duration. A zero value permits unlimited attempts.

Valid Values: 0 to 65500

Default Value: 3

**netMgmtConsoleSilentTime (integer)**

This read-write MIB object configures the number of minutes during which the management console will be unavailable after repeated failed attempts to logon.

Valid Values: 0 to 65500

Default Value: 0 (no silent time)

**netMgmtModemInitString (display string)**

This read-write MIB object is the initialization string used to configure an attached modem. Specify this string with up to 48 characters if the modem is not Hayes compatible. Only the initialization commands need to be specified. *Do not* specify any modem prefix string such as the AT attention sequence, or any suffix such as the CR character.

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This string takes effect after every line hang-up.

Default Value: E0V1M1

### netMgmtModemDialString (display string)

This read-write MIB object string of up to 48 characters contains a phone number which is used to establish a modem connection with a remote site. Only the phone number needs to be specified (that is, *do not* specify any dial prefix string such as ATDT).

Leave this string empty if this dial-out capability is not desired. This string takes effect after every line hang-up.

### netMgmtModemDialDelay (integer)

This read-write MIB object specifies a delay in seconds between every dial-out failure. The value zero indicates an infinite delay. Normally, the Catalyst 2000 switch will attempt a dial-out if the netMgmtModemDialString object is non-empty. If the remote site then fails to answer, and auto-answer has been disabled on this system, the system will retry the dial-out attempt after this delay has passed.

If auto-answer is enabled and the first dial-out attempt fails, the system will stop further dial-out attempts and immediately go into auto-answer mode.

Valid Values: 0 to 65500

Default Value: 300 seconds

### netMgmtModemAutoAnswer (integer)

This read-write MIB object specifies whether the system should be in auto-answer mode and only accept incoming calls.



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**Note** The system will always attempt a dial-out first if the netMgmtModemDialString object is non-empty.

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Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

## The Upgrade Group

This group contains a collection of Upgrade facility MIB objects.

### upgradeFirmwareSource (integer)

This read-write MIB object selects the source from which firmware is read. A valid selection will cause a system reset, followed by the execution of the selected firmware. A valid selection is defined as follows:

- A selection which yields a firmware that is different from the one currently executing
- Selection of flash, for which FLASH memory is available and contains a checksum verified firmware.

Valid Values: eprom (1)

flash (2)

Default Value: eprom (1)

### upgradeEPROMRevision (display string)

This read-only MIB object returns the revision number of the Catalyst 2000 switch firmware residing in EPROM. The string has the format *V2.01*.

## System Information

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### upgradeFlashSize (integer)

This read-only MIB object displays the size of available FLASH memory in the system, in kilobytes. For example: 128 equals 131072 bytes (128 bytes times 1024).

### upgradeFlashBankStatus (display string)

This read-only MIB object displays a text string indicating status and version of last upgrade version, including the source of the upgrade version, and the date and time of upgrade. The string is in net ASCII and conforms exactly to one of the following formats, depending upon the source of the upgrade:

- V2.01 written on Mon Sep 21 07:02:01 1992 from serial terminal: valid
- V2.01 written on Tue Dec 01 15:19:15 1992 from 192.009.200.200: invalid

### upgradeTFTPServerAddress (IpAddress)

This read-write MIB object contains the IP address of a TFTP server from which a firmware image can be downloaded. The download may be initiated by setting the upgradeTFTPInitiate to upgrade, or via an out-of-band management action.

Default Value: 0.0.0.0, or no address

### upgradeTFTPLoadFilename (display string)

This read-write MIB object contains the name of the file of up to 80 characters containing a firmware upgrade image on the host whose address is given by upgradeTFTPServerAddress.

Default Value: empty string, or no filename

**upgradeTFTPInitiate (integer)**

Setting this read-write MIB object to noUpgrade results in no action. When set to upgrade, the Catalyst 2000 switch will attempt to download a firmware upgrade image from the server whose address is given by upgradeTFTPServerAddress. The image is found in the file whose name is given by upgradeTFTPLoadFilename. Both upgradeTFTPServerAddress and upgradeTFTPLoadFilename must be non-empty for the upgrade to proceed.

This object always returns noUpgrade when read.

Valid Values: upgrade (1)

noUpgrade (2)

Default Value: noUpgrade (2)

**upgradeAutoExecute (integer)**

This read-write MIB object indicates whether a newly upgraded firmware version should immediately be selected for execution. When this object is disabled, the user must explicitly set the upgradeFirmwareSource object to select and run a particular firmware version after an upgrade.

When this object is enabled after a successful firmware upgrade, the Catalyst 2000 switch will automatically switch to run the new firmware.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

## System Information

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### upgradeTFTPAccept (integer)

This read-write MIB object controls the second method of firmware upgrade using TFTP. The Catalyst 2000 switch has a UDP Listener on the TFTP server port, and can accept upgrade requests from any workstation with Internet Protocol TFTP software.

This object enables or disables the TFTP Upgrade Listener. When disabled, no TFTP workstations can download a firmware upgrade image to the Catalyst 2000 switch.

Valid Values: enabled (1)

disabled (2)

Default Value: enabled (1)

## The VLAN Group

### vlanMaxSupported (integer)

This read-only MIB object displays the maximum number of virtual LANs supported. This object represents the upper bound of the index into the vlanTable.

Valid Values: 4

### vlanAllowMembershipOverlap (integer)



**Caution** overlapped VLANs may lead to loops or loss of connectivity in the spanning-tree topology and should only be used with caution.

When set to disabled, the Catalyst 2000 switch will ensure that no port can simultaneously be a member of more than one VLAN.

Valid Values: enabled (1)

disabled (2)

Default Value: disabled (2)

#### vlanTable

This read-only MIB object displays a list of configuration entries for a VLAN.

#### vlanIndex (integer)

This read-only MIB object displays the number from 1 to `vlanMaxSupported` identifying a configured VLAN.

#### vlanName (display string)

This read-write MIB object contains a descriptive string of up to 60 characters used by the network administrator to name a VLAN.

#### vlanMemberPorts (octet string)

This read-only MIB object displays the set of Catalyst 2000 switch member ports for the VLAN. A port may reside within multiple VLANs only if the object `vlanAllowMembershipOverlap` has been set to enabled.

This object cannot be used to configure VLAN membership. The table `vlanMemberTable` is used for that purpose.

Each octet within the value of this object specifies a set of eight ports, with the first octet specifying ports 1 through 8, the second octet specifying ports 9 through 16, and so on. Within each octet, the most significant bit represents the lowest numbered port, and the least

## System Information

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significant bit represents the highest numbered port. Thus, each port of the VLAN is represented by a single bit within the value of this object. If that bit has a value of 1 then that port is included in the set of ports; the port is not included if its bit has a value of 0.

Initially, a single VLAN includes all ports.

Default Value: All ports

### vlanIpAddress (IpAddress)

This read-write MIB object sets the administrative IP address for this VLAN. Note that once a value has been set for this object, the next write will only take effect after a system reset.

Default Value: same as the address contained in netMgmtIpAddress

### vlanIpSubnetMask (IpAddress)

This read-write MIB object contains the administrative IP subnet mask for this VLAN. A change in the subnet mask at any time will immediately take effect.

Default Value: same as the mask contained in netMgmtIpSubnetMask

### vlanMemberTable

This read-only MIB object displays a list of port membership configuration entries for a VLAN.

### vlanMemberIndex (integer)

This read-only MIB object displays the number from 1 to vlanMaxSupported identifying a configured VLAN. The same value of a VLAN index variable for any of the VLAN tables in this MIB group selects the same VLAN.

**vlanMemberPortIndex (integer)**

This read-only MIB object displays the number from 1 to sysInfoNumberOfSwitchPorts identifying an individually switched port. The same value of a port index variable for any of the port tables selects the same port.

**vlanMemberPortOfVlan (integer)**

This read-write MIB object contains the port identified by vlanMemberPortIndex and becomes a member of the VLAN identified by vlanMemberIndex when this object is set to true. The same port ceases to be member of that VLAN when the object is set to false.

All ports in the Catalyst 2000 switch must belong to some VLAN. Consequently, the Catalyst 2000 switch will return badValue if this object is used to remove the port from all membership lists.

Note that when vlanAllowMembershipOverlap is disabled, a port can only be member of exactly one VLAN. In this case, setting vlanMemberPortOfVlan to true for a port adds the port to the membership list of the current VLAN and removes the same port from all other VLAN membership lists.

When vlanAllowMembershipOverlap is enabled, a port may reside in multiple VLANs. Setting vlanMemberPortOfVlan to true in this case adds the port to the membership list of the current VLAN and does not change other VLAN membership lists.

Valid Values: true (1)

false (2)

## Bandwidth Usage Information

**bandwidthUsageCurrent (counter)**

This read-only MIB object displays the bandwidth currently consumed. The measurement unit is in megabits per second (1,000,000 bits/second).

## System Information

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### bandwidthUsagePeakInterval (integer)

This read-write MIB object specifies the length of time which forms a peak bandwidth capture interval. A write to this object with any new value restarts the peak bandwidth capture at the first interval. In other words, the bandwidthUsagePeakTable will be cleared and entry number 1 will record the peak for a new first interval.

Valid Values:	one hour	(1)
	three hours	(3)
	six hours	(6)
	twelve hours	(12)
	one day	(24)
	two days	(48)
	three days	(72)
	four days	(96)
	five days	(120)
	six days	(144)
	one week	(168)
Default Value:	one day	(24)



**bandwidthUsagePeakRestart (integer)**

This read-write MIB object is set to restart to clear the bandwidthUsagePeakTable and restart the peak bandwidth capturing at the current interval. No action will be taken if this object is set to noRestart. This object always returned noRestart when read.

Valid Values: noRestart (1)

restart (2)

Default Value: noRestart (1)

**bandwidthUsagePeakTable**

This read-only MIB object displays a list of entries containing peak bandwidth usages in a number of time periods.

**bandwidthUsagePeakIndex (integer)**

This read-only MIB object displays the number from 1 to bandwidthUsageMaxPeakEntries identifying a particular bandwidthUsagePeakEntry.

**bandwidthUsageStartTime (display string)**

This read-only MIB object displays up to 32 characters containing the date and time that marks the start of this capture interval. The string is in net ASCII and conforms exactly to the following format:

Mon Sep 21 07:00:00 1992

**bandwidthUsagePeak (integer)**

This read-only MIB object displays the highest bandwidth utilized since the time given in bandwidthUsageStartTime or last cleared. The measurement unit is in megabits per second (1,000,000 bits/second).

## System Information

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### bandwidthUsagePeakTime (display string)

This read-only MIB object displays up to 32 characters containing the date and time the value in bandwidthUsagePeak is captured. The string is in net ASCII and conforms exactly to the following format:

```
Mon Sep 21 07:02:01 1992
```